

What is claimed is:

1. A microfluidic device comprising:
  - a plurality of device layers defining a plurality of operational microfluidic structures; and
  - 5 a channel collapse detection structure defined in at least one device layer of the plurality of the device layers;
    - wherein the channel collapse detection structure is not in fluid communication with any operational microfluidic structure of the plurality of operational microfluidic structures.
- 10 2. The microfluidic device of claim 1 wherein the channel collapse detection structure comprises a substantially linear channel having a variable width.
3. The microfluidic device of claim 1 wherein the channel collapse detection structure comprises a plurality of channel segments each having a different width.
- 15 4. The microfluidic device of claim 1 wherein the channel collapse detection structure comprises an open well.
5. The microfluidic device of claim 1 wherein any device layer of the plurality of device
- 20 layers is a stencil layer.
6. The microfluidic device of claim 1 wherein any device layer of the plurality of device layers comprises a polymeric material.
- 25 7. The microfluidic device of claim 1 wherein each device layer of the plurality of device layers comprises an adhesiveless polymer layer.
8. The microfluidic device of claim 7 wherein the polymer layer comprises a vinyl-based polymer.
- 30 9. The microfluidic device of claim 8 wherein the polymer layer comprises a polyolefin.
10. The microfluidic device of claim 8 wherein the polymer layer comprises polypropylene.

11. A system comprising:

the microfluidic device of claim 1;

an illumination source positioned to direct a signal through the channel collapse detection structure; and

5 a detector positioned to sense the signal.

12. A method for detecting a manufacturing defect in a microfluidic device, the method comprising the steps of:

providing a microfluidic device having a channel collapse detection structure; and

10 examining the channel collapse detection structure.

13. The method of claim 12 wherein the step of examining the channel collapse detection structure includes performing a visual examination.

15 14. The method of claim 12 wherein the step of examining the channel collapse detection structure further comprises the steps of:

positioning an illumination source adjacent the channel collapse detection structure; and  
positioning a detector in sensory communication with the illumination source.

20 15. The method of claim 12 wherein the step of examining the channel collapse detection structure further comprises the steps of:

injecting a light absorbing dye into the channel collapse detection structure;

positioning an illumination source adjacent to the channel collapse detection structure;

and

25 positioning a detector in sensory communication with the illumination source.

16. The method of claim 12 wherein:

the channel collapse detection structure is an open channel; and

wherein the step of examining the channel collapse test structure comprises measuring

30 the depth of the open channel.